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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/599,813	07/17/2007	Anand Chellappa	37929-32102	5027
86451	7590	03/15/2010		
Luce, Forward, Hamilton & Scripps LLP 2050 Main Street, Suite 600 Irvine, CA 92614				
EXAMINER				
HANDAL, KAITY V				
ART UNIT		PAPER NUMBER		
1795				
MAIL DATE		DELIVERY MODE		
03/15/2010		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/599,813

**Applicant(s)**

CHELLAPPA, ANAND

**Examiner**

KAITY V. HANDAL

**Art Unit**

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 1/25/2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 1-14 and 29-31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/22)
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date: \_\_\_\_\_

**DETAILED ACTION**

***Election/Restrictions***

1. Applicant's election of Species II (claims 15-28) in the reply filed on 1/25/2010 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

***Specification***

2. The abstract of the disclosure does not commence on a separate sheet in accordance with 37 CFR 1.52(b)(4). A new abstract of the disclosure is required and must be presented on a separate sheet, apart from any other text.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 15-20, 24 and 26-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Clawson et al. (US 6,083,425).

With respect to claim 15, Clawson teaches an apparatus comprising:  
a steam reformer (Fig. 1, 26) wherein a reaction resulting in steam reformation of the

hydrocarbon fuel is performed, the steam reformer including a portion having a plurality of steam reformation catalysts disposed therein (28 & 66 & 84) (col. 6, lines 14-45).

With respect to claim 16, Clawson teaches wherein said plurality of steam reformation catalysts (28 & 66 & 84) are provided in a staged configuration (as illustrated).

With respect to claim 17, Clawson teaches wherein said staged configuration includes a coke-resistant steam reformation catalyst (28) loaded at an entrance of said steam reformer (as illustrated).

With respect to claim 18, Clawson teaches wherein said plurality of steam reformation catalysts includes at least two of a high-activity steam reformation catalyst (66), a coke-resistant steam reformation catalyst (28) and a steam reformation catalyst which promotes a water-gas shift reaction (84) (col. 6, lines 14-45) (as illustrated).

With respect to claim 19, Clawson teaches wherein said high-activity steam reformation catalyst (66) is a supported nickel-based catalyst/(transition metal oxides supported on a perforated plate (70)) (col. 4, lines 32-58).

With respect to claim 20, Clawson teaches wherein said coke-resistant stream reformation catalyst (28) is a supported doped nickel-based catalyst supported on a perforated plate (30) (col. 3, lines 63-67 and col. 4, lines 5-10).

With respect to claim 24, Clawson teaches wherein said coke-resistant stream reformation catalyst (28) is loaded at an entrance of said steam reformer, followed by said high-activity steam reformation catalyst (66) (as illustrated).

With respect to claims 26-27, Clawson teaches wherein the plurality of catalysts are powders or coatings supported on a substrate (col. 4, lines 8-10 and 54-56) where Clawson teaches that the catalyst is powder/granules supported by mesh/(perforated plates (30 and 70)).

With respect to claim 28, Clawson teaches wherein a fuel cell is in fluid communication with the hydrogen generation reactor (col. 1, lines 54-56).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 21-23 are rejected under 35 U.S.C. 103(a) as obvious over Clawson et al. (US 6,083,425), as applied to claim 20 above, and further in view of Lomax, JR. et al. (US 2002/0146359).

With respect to claim 21, Clawson discloses all claim limitations as set forth above, and further teaches wherein said supported doped nickel-based catalyst (28) is comprised of magnesium aluminate. Clawson fails to teach wherein the nickel based catalyst (28) is comprised of calcium aluminate. However, as evidenced in Lomax, JR. that the two aluminates are functionally equivalent to one another as one can be an alternative to the other in steam reforming catalyst (P6/para.[0081]). Therefore, one skilled in the art would have chosen to replace the magnesium

aluminate of Clawson with the calcium aluminate of Lomax, JR. as doing so would amount to nothing more than use of a known material for its intended use in a known environment to accomplish an entirely expected result, as evidenced by Lomax, JR.

With respect to claim 22, Clawson teaches wherein said supported doped nickel-based catalysts is further comprised of at least one noble metal (col. 3, lines 61-67).

With respect to claim 23, Clawson teaches wherein said at least one noble metal is at least one of platinum, palladium, rhodium, or ruthenium or any combination thereof (col. 3, lines 61-67).

7. Claim 25 is rejected under 35 U.S.C. 103(a) as obvious over Clawson et al. (US 6,083,425), as applied to claim 19 above, and further in view of Korotkikh et al. (US 2003/00464887)

With respect to claim 25, Clawson discloses all claim limitations as set forth above including the high activity steam reformation catalyst/(high temperature shift catalyst) (66) comprising at least one noble metal component (col. 4, lines 43-54). Clawson's teaching of the high activity steam reformation catalyst to comprise a noble metal is an alternative to the catalyst comprising a nickel oxide/(transition metal oxide) (col. 4, lines 43-54), and not in combination therewith. However, it is well known in the art to employ a high temperature water gas shift catalyst comprising a combination of a nickel oxide and a noble metal as evidenced in Korotkikh (P4/para. [0056]). Therefore, one skilled in the art would have chosen to use the combination of a nickel oxide and a noble metal in Clawson's apparatus, as

an obvious alternative using the two in the alternative since doing so would amount to nothing more than the use of a known material for its intended use in a known environment to accomplish an entirely expected result, as evidenced by Korotkikh.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KAITY V. HANDAL whose telephone number is (571)272-8520. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Alexa Neckel can be reached on (571) 272-1446. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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